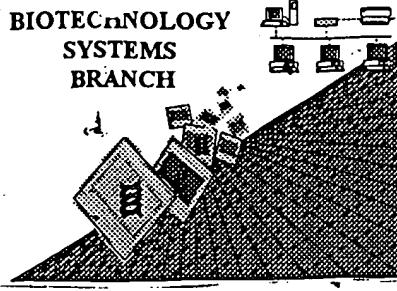


01/18
01/98

RAW SEQUENCE LISTING ERROR REPORT



The Biotechnology Systems Branch of the Scientific and Technical Information Center (STIC) detected errors when processing the following computer readable form:

Application Serial Number: 101000,151
Source: O1PE
Date Processed by STIC: (2)10/01

THE ATTACHED PRINTOUT EXPLAINS DETECTED ERRORS.

PLEASE FORWARD THIS INFORMATION TO THE APPLICANT BY EITHER:

- 1) **INCLUDING A COPY OF THIS PRINTOUT IN YOUR NEXT COMMUNICATION TO THE APPLICANT, WITH A NOTICE TO COMPLY or,**
- 2) **TELEPHONING APPLICANT AND FAXING A COPY OF THIS PRINTOUT, WITH A NOTICE TO COMPLY**

FOR CRF SUBMISSION QUESTIONS, PLEASE CONTACT MARK SPENCER, 703-308-4212.

FOR SEQUENCE RULES INTERPRETATION, PLEASE CONTACT ROBERT WAX, 703-308-4216.

PATENTIN 2.1 e-mail help: patin21help@uspto.gov or phone 703-306-4119 (R. Wax)

PATENTIN 3.0 e-mail help: patin3help@uspto.gov or phone 703-306-4119 (R. Wax)

TO REDUCE ERRORED SEQUENCE LISTINGS, PLEASE USE THE CHECKER VERSION 3.0 PROGRAM, ACCESSIBLE THROUGH THE U.S. PATENT AND TRADEMARK OFFICE WEBSITE. SEE BELOW:

Checker Version 3.0

The Checker Version 3.0 application is a state-of-the-art Windows based software program employing a logical and intuitive user-interface to check whether a sequence listing is in compliance with format and content rules. Checker Version 3.0 works for sequence listings generated for the original version of 37 CFR §§1.821 – 1.825 effective October 1, 1990 (old rules) and the revised version (new rules) effective July 1, 1998 as well as World Intellectual Property Organization (WIPO) Standard ST.25.

Checker Version 3.0 replaces the previous DOS-based version of Checker, and is Y2K-compliant. Checker allows public users to check sequence listings in Computer Readable form (CRF) before submitting them to the United States Patent and Trademark Office (USPTO). Use of Checker prior to filing the sequence listing is expected to result in fewer errored sequence listings, thus saving time and money.

Checker Version 3.0 can be down loaded from the USPTO website at the following address:
<http://www.uspto.gov/web/offices/pac/checker>

OIPE

RAW SEQUENCE LISTING
PATENT APPLICATION: US/10/000,151

DATE: 12/10/2001
TIME: 15:02:00

Input Set : A:\HERG-KCR1.ST25.txt
Output Set: N:\CRF3\12102001\I000151.raw

**Does Not Comply
Corrected Diskette Needed**

Errors on p. 143

Corrected Diskette Nee
Errors on p. 1+3

3 <110> APPLICANT: Vanderbilt University
4 Balser, Jeffrey R.
5 George, Alfred L.
6 Roden, Dan M.
8 <120> TITLE OF INVENTION: HUMAN KCR1 REGULATION OF HERG POTASSIUM CHANNEL BLOCK
10 <130> FILE REFERENCE: 1242-49
C--> 12 <140> CURRENT APPLICATION NUMBER: US/10/000,151
C--> 12 <141> CURRENT FILING DATE: 2001-10-30
12 <150> PRIOR APPLICATION NUMBER: 60/244,340
13 <151> PRIOR FILING DATE: 2000-10-30
15 <160> NUMBER OF SEQ ID NOS: 7
17 <170> SOFTWARE: PatentIn version 3.1
19 <210> SEQ ID NO: 1
20 <211> LENGTH: 1857
21 <212> TYPE: DNA
22 <213> ORGANISM: Homo sapiens
24 <220> FEATURE:
25 <221> NAME/KEY: CDS
26 <222> LOCATION: (1)..(1422) → there is no n within this range
27 <223> OTHER INFORMATION: n is any nucleotide
30 <220> FEATURE:
31 <221> NAME/KEY: misc_feature
32 <222> LOCATION: (1)..(1857)
33 <223> OTHER INFORMATION: n is any nucleotide
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37 atg ggc cag cta gag ggt tac tgt ttc tcg gcc ttg agc tgt acc 48
38 Met Ala Gln Leu Glu Gly Tyr Cys Phe Ser Ala Ala Leu Ser Cys Thr
39 1 5 10 15
41 ttt tta gtg tcc tgc ctc ctc ttc tcc gcc ttc agc cggtt cgt cga 96
42 Phe Leu Val Ser Cys Leu Leu Phe Ser Ala Phe Ser Arg Ala Leu Arg
43 20 25 30
45 gag ccc tac atg gac gag atc ttc cac ctg cct cag gcgtt cgt ctc 144
46 Glu Pro Tyr Met Asp Glu Ile Phe His Leu Pro Gln Ala Gln Arg Tyr
47 35 40 45
49 tgt gag ggc cat ttc tcc ctt tcc cag tgg gat ccc atg att act aca 192
50 Cys Glu Gly His Phe Ser Leu Ser Gln Trp Asp Pro Met Ile Thr Thr
51 50 55 60
53 tta cct ggc ttg tac ctg gtg tca gtt gga gtg gtc aaa cct gcc att 240
54 Leu Pro Gly Leu Tyr Leu Val Ser Val Gly Val Val Lys Pro Ala Ile
55 65 70 75 80
57 tgg atc ttt gga tgg tct gaa cat gtt gtc tgc tcc att ggg atg ctc 288
58 Trp Ile Phe Gly Trp Ser Glu His Val Val Cys Ser Ile Gly Met Leu
59 85 90 95
61 aga ttt gtt aat ctt ctc ttc agt gtt ggc aac ttc tat tta cta tat 336
62 Arg Phe Val Asn Leu Leu Phe Ser Val Gly Asn Phe Tyr Leu Leu Tyr
63 100 105 110
65 ttg ctt ttc cac aag qta caa ccc aqa aac aag qct gcc tca aqt atc 384

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DATE: 12/10/2001
TIME: 15:02:00

Input Set : A:\HERG-KCR1.ST25.txt
Output Set: N:\CRF3\12102001\I000151.raw

66	Leu	Leu	Phe	His	Lys	Val	Gln	Pro	Arg	Asn	Lys	Ala	Ala	Ser	Ser	Ile	
67		115					120							125			
69	cag	aga	gtc	ttg	tca	aca	tta	aca	cta	gca	gta	ttt	cca	aca	ctt	tat	432
70	Gln	Arg	Val	Leu	Ser	Thr	Leu	Thr	Leu	Ala	Val	Phe	Pro	Thr	Leu	Tyr	
71		130					135							140			
73	ttt	ttt	aac	ttc	ctt	tat	tat	aca	gaa	gca	gga	tct	atg	ttt	ttt	act	480
74	Phe	Phe	Asn	Phe	Leu	Tyr	Tyr	Thr	Glu	Ala	Gly	Ser	Met	Phe	Phe	Thr	
75	145				150					155						160	
77	ctt	ttt	gca	tat	ttg	atg	tgt	ctt	tat	gga	aat	cat	aaa	act	tca	gcc	528
78	Leu	Phe	Ala	Tyr	Leu	Met	Cys	Leu	Tyr	Gly	Asn	His	Lys	Thr	Ser	Ala	
79		165				170								175			
81	ttc	ctt	gga	ttt	tgt	ggc	ttc	atg	ttt	cgg	caa	aca	aat	atc	atc	tgg	576
82	Phe	Leu	Gly	Phe	Cys	Gly	Phe	Met	Phe	Arg	Gln	Thr	Asn	Ile	Ile	Trp	
83		180				185								190			
85	gct	gtc	tcc	tgt	gca	ggg	aat	gtc	att	gca	caa	aag	tta	act	gag	gct	624
86	Ala	Val	Phe	Cys	Ala	Gly	Asn	Val	Ile	Ala	Gln	Lys	Leu	Thr	Glu	Ala	
87		195				200								205			
89	tgg	aaa	act	gag	cta	caa	aag	aag	gaa	gac	aga	ctt	cca	cct	att	aaa	672
90	Trp	Lys	Thr	Glu	Leu	Gln	Lys	Lys	Glu	Asp	Arg	Leu	Pro	Pro	Ile	Lys	
91		210				215								220			
93	gga	cca	ttt	gca	gaa	ttc	aga	aaa	att	ctt	cag	ttt	ctt	ttg	gct	tat	720
94	Gly	Pro	Phe	Ala	Glu	Phe	Arg	Lys	Ile	Leu	Gln	Phe	Leu	Leu	Ala	Tyr	
95	225		230				235							240			
97	tcc	atg	tcc	ttt	aaa	aac	ttg	agt	atg	ctt	ttc	tgt	ttg	act	tgg	ccc	768
98	Ser	Met	Ser	Phe	Lys	Asn	Leu	Ser	Met	Leu	Phe	Cys	Leu	Thr	Trp	Pro	
99		245				250								255			
101	tac	atc	ctt	ctg	gga	ttt	ctg	ttt	tgt	gct	ttt	gta	gta	gtt	aat	ggt	816
102	Tyr	Ile	Leu	Leu	Gly	Phe	Leu	Phe	Cys	Ala	Phe	Val	Val	Val	Asn	Gly	
103		260				265								270			
105	gga	att	gtt	att	ggc	gat	cgg	agt	agt	cat	gaa	gcc	tgt	ctt	cat	ttt	864
106	Gly	Ile	Val	Ile	Gly	Asp	Arg	Ser	Ser	His	Glu	Ala	Cys	Leu	His	Phe	
107		275				280								285			
109	cct	caa	cta	ttc	tac	ttt	ttt	tca	ttt	act	ctc	ttt	ttt	tct	ttt	cct	912
110	Pro	Gln	Leu	Phe	Tyr	Phe	Phe	Ser	Phe	Thr	Leu	Phe	Phe	Ser	Phe	Pro	
111		290				295								300			
113	cat	ctc	ctg	tct	cct	agg	aaa	att	aag	act	ttt	ctt	tcc	tta	gtt	tgg	960
114	His	Leu	Leu	Ser	Pro	Ser	Lys	Ile	Lys	Thr	Phe	Leu	Ser	Leu	Val	Trp	
115	305		310				315							320			
117	aaa	cat	gga	att	ctg	ttt	ttg	gtg	gtt	acc	tta	gtc	tct	gtg	ttt	tta	1008
118	Lys	His	Gly	Ile	Leu	Phe	Leu	Val	Val	Thr	Leu	Val	Ser	Val	Phe	Leu	
119		325				330								335			
121	gtt	tgg	aaa	ttc	act	tat	gct	cat	aaa	tac	ttg	cta	gca	gac	aat	aga	1056
122	Val	Trp	Lys	Phe	Thr	Tyr	Ala	His	Lys	Tyr	Leu	Leu	Ala	Asp	Asn	Arg	
123		340				345								350			
125	cat	tat	act	ttc	tat	gtg	tgg	aaa	aga	gtt	ttt	caa	aga	tat	gca	att	1104
126	His	Tyr	Thr	Phe	Tyr	Val	Trp	Lys	Arg	Val	Phe	Gln	Arg	Tyr	Ala	Ile	
127		355				360								365			
129	ctg	aaa	tat	ttg	tta	gtt	cca	gcc	tat	ata	ttt	gct	ggt	tgg	agt	ata	1152
130	Leu	Lys	Tyr	Leu	Leu	Val	Pro	Ala	Tyr	Ile	Phe	Ala	Gly	Trp	Ser	Ile	

RAW SEQUENCE LISTING
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Input Set : A:\HERG-KCR1.ST25.txt
Output Set: N:\CRF3\12102001\I000151.raw

131	370	375	380	
133	gct gac tca ttg aaa tca aag cca att ttt tgg aat tta atg ttt ttc			1200
134	Ala Asp Ser Leu Lys Ser Lys Pro Ile Phe Trp Asn Leu Met Phe Phe			
135	385	390	395	400
137	ata tgc ttg ttc att gtt ata gtt cct cag aaa ctg ctg gaa ttt cgt			1248
138	Ile Cys Leu Phe Ile Val Ile Val Pro Gln Lys Leu Leu Glu Phe Arg			
139	405	410	415	
141	tac ttc att tta cct tat gtc att tat agg ctt aac ata act ctg cct			1296
142	Tyr Phe Ile Leu Pro Tyr Val Ile Tyr Arg Leu Asn Ile Thr Leu Pro			
143	420	425	430	
145	ccc aca tcc aga ctt gtt tgt gaa ctg agt tgc tat gca att gtt aat			1344
146	Pro Thr Ser Arg Leu Val Cys Glu Leu Ser Cys Tyr Ala Ile Val Asn			
147	435	440	445	
149	ttc ata act ttt tac atc ttt ctg aac aag act ttt cag tgg cca aat			1392
150	Phe Ile Thr Phe Tyr Ile Phe Leu Asn Lys Thr Phe Gln Trp Pro Asn			
151	450	455	460	
153	agt cag gac att caa agg ttt atg tgg taa tatcagtgtat attttgaact			1442
154	Ser Gln Asp Ile Gln Arg Phe Met Trp			
155	465	470		
W-->	157 gtaaaaatgg acttaataat agaccatttc tacaaaagaac aactgaatag gngaaaaaca			1502
159	tggaatttct tttaggtgca gtgggtgtct tcaaattaca ttagttttt taatatatat			1562
161	tttaaacata tgtaagaaat taagtggcaa agaactggga aagcttaaga cctgcttcaa			1622
W-->	163 angcctgaat aatggaaaaaaa taaaanwngtt tncagatatac tcataatcgct cnnknatgn			1682
W-->	165 tggcccytmn caangcttgg gaatgkttnn wntgnataag ttnattaaan ctgggnntgc			1742
W-->	167 tnnmwatnac ttnnnkncna nccwnnnwac natgnnntan nnantatta caaaggctcag			1802
W-->	169 gtgatattct tgactgaaaaa gtgctctnaa cataaaagta aatatgngcc ncaa			1857
172	<210> SEQ ID NO: 2			
173	<211> LENGTH: 473			
174	<212> TYPE: PRT			
175	<213> ORGANISM: Homo sapiens			
177	<220> FEATURE:			
178	<221> NAME/KEY: misc.feature			
179	<222> LOCATION: ((1)..(1857))			
180	<223> OTHER INFORMATION: n is any nucleotide			
182	<400> SEQUENCE: 2			
184	Met Ala Gln Leu Glu Gly Tyr Cys Phe Ser Ala Ala Leu Ser Cys Thr			
185	1	5	10	15
188	Phe Leu Val Ser Cys Leu Leu Phe Ser Ala Phe Ser Arg Ala Leu Arg			
189	20	25	30	
192	Glu Pro Tyr Met Asp Glu Ile Phe His Leu Pro Gln Ala Gln Arg Tyr			
193	35	40	45	
196	Cys Glu Gly His Phe Ser Leu Ser Gln Trp Asp Pro Met Ile Thr Thr			
197	50	55	60	
200	Leu Pro Gly Leu Tyr Leu Val Ser Val Gly Val Val Lys Pro Ala Ile			
201	65	70	75	80
204	Trp Ile Phe Gly Trp Ser Glu His Val Val Cys Ser Ile Gly Met Leu			
205	85	90	95	
208	Arg Phe Val Asn Leu Leu Phe Ser Val Gly Asn Phe Tyr Leu Leu Tyr			
209	100	105	110	

n does not exist within this range

"n" can not be in an amino acid sequence

RAW SEQUENCE LISTING

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Input Set : A:\HERG-KCR1.ST25.txt
 Output Set: N:\CRF3\12102001\I000151.raw

```

212 Leu Leu Phe His Lys Val Gln Pro Arg Asn Lys Ala Ala Ser Ser Ile
213      115          120          125
216 Gln Arg Val Leu Ser Thr Leu Thr Leu Ala Val Phe Pro Thr Leu Tyr
217      130          135          140
220 Phe Phe Asn Phe Leu Tyr Tyr Thr Glu Ala Gly Ser Met Phe Phe Thr
221 145          150          155          160
224 Leu Phe Ala Tyr Leu Met Cys Leu Tyr Gly Asn His Lys Thr Ser Ala
225      165          170          175
228 Phe Leu Gly Phe Cys Gly Phe Met Phe Arg Gln Thr Asn Ile Ile Trp
229      180          185          190
232 Ala Val Phe Cys Ala Gly Asn Val Ile Ala Gln Lys Leu Thr Glu Ala
233      195          200          205
236 Trp Lys Thr Glu Leu Gln Lys Lys Glu Asp Arg Leu Pro Pro Ile Lys
237 210          215          220
240 Gly Pro Phe Ala Glu Phe Arg Lys Ile Leu Gln Phe Leu Leu Ala Tyr
241 225          230          235          240
244 Ser Met Ser Phe Lys Asn Leu Ser Met Leu Phe Cys Leu Thr Trp Pro
245      245          250          255
248 Tyr Ile Leu Leu Gly Phe Leu Phe Cys Ala Phe Val Val Val Asn Gly
249      260          265          270
252 Gly Ile Val Ile Gly Asp Arg Ser Ser His Glu Ala Cys Leu His Phe
253      275          280          285
256 Pro Gln Leu Phe Tyr Phe Phe Ser Phe Thr Leu Phe Phe Ser Phe Pro
257 290          295          300
260 His Leu Leu Ser Pro Ser Lys Ile Lys Thr Phe Leu Ser Leu Val Trp
261 305          310          315          320
264 Lys His Gly Ile Leu Phe Leu Val Val Thr Leu Val Ser Val Phe Leu
265      325          330          335
268 Val Trp Lys Phe Thr Tyr Ala His Lys Tyr Leu Leu Ala Asp Asn Arg
269      340          345          350
272 His Tyr Thr Phe Tyr Val Trp Lys Arg Val Phe Gln Arg Tyr Ala Ile
273      355          360          365
276 Leu Lys Tyr Leu Leu Val Pro Ala Tyr Ile Phe Ala Gly Trp Ser Ile
277      370          375          380
280 Ala Asp Ser Leu Lys Ser Lys Pro Ile Phe Trp Asn Leu Met Phe Phe
281 385          390          395          400
284 Ile Cys Leu Phe Ile Val Ile Val Pro Gln Lys Leu Leu Glu Phe Arg
285      405          410          415
288 Tyr Phe Ile Leu Pro Tyr Val Ile Tyr Arg Leu Asn Ile Thr Leu Pro
289      420          425          430
292 Pro Thr Ser Arg Leu Val Cys Glu Leu Ser Cys Tyr Ala Ile Val Asn
293      435          440          445
296 Phe Ile Thr Phe Tyr Ile Phe Leu Asn Lys Thr Phe Gln Trp Pro Asn
297      450          455          460
300 Ser Gln Asp Ile Gln Arg Phe Met Trp
301 465          470
304 <210> SEQ ID NO: 3
305 <211> LENGTH: 1159
306 <212> TYPE: PRT

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RAW SEQUENCE LISTING
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DATE: 12/10/2001
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Input Set : A:\HERG-KCR1.ST25.txt
Output Set: N:\CRF3\12102001\I000151.raw

307 <213> ORGANISM: Homo sapiens
 309 <400> SEQUENCE: 3
 311 Met Pro Val Arg Arg Gly His Val Ala Pro Gln Asn Thr Phe Leu Asp
 312 1 5 10 15
 315 Thr Ile Ile Arg Lys Phe Glu Gly Gln Ser Arg Lys Phe Ile Ile Ala
 316 20 25 30
 319 Asn Ala Arg Val Glu Asn Cys Ala Val Ile Tyr Cys Asn Asp Gly Phe
 320 35 40 45
 323 Cys Glu Leu Cys Gly Tyr Ser Arg Ala Glu Val Met Gln Arg Pro Cys
 324 50 55 60
 327 Thr Cys Asp Phe Leu His Gly Pro Arg Thr Gln Arg Arg Ala Ala Ala
 328 65 70 75 80
 331 Gln Ile Ala Gln Ala Leu Leu Gly Ala Glu Glu Arg Lys Val Glu Ile
 332 85 90 95
 335 Ala Phe Tyr Arg Lys Asp Gly Ser Cys Phe Leu Cys Leu Val Asp Val
 336 100 105 110
 339 Val Pro Val Lys Asn Glu Asp Gly Ala Val Ile Met Phe Ile Leu Asn
 340 115 120 125
 343 Phe Glu Val Val Met Glu Lys Asp Met Val Gly Ser Pro Ala His Asp
 344 130 135 140
 347 Thr Asn His Arg Gly Pro Pro Thr Ser Trp Leu Ala Pro Gly Arg Ala
 348 145 150 155 160
 351 Lys Thr Phe Arg Leu Lys Leu Pro Ala Leu Leu Ala Leu Thr Ala Arg
 352 165 170 175
 355 Glu Ser Ser Val Arg Ser Gly Gly Ala Gly Gly Ala Gly Ala Pro Gly
 356 180 185 190
 359 Ala Val Val Val Asp Val Asp Leu Thr Pro Ala Ala Pro Ser Ser Glu
 360 195 200 205
 363 Ser Leu Ala Leu Asp Glu Val Thr Ala Met Asp Asn His Val Ala Gly
 364 210 215 220
 367 Leu Gly Pro Ala Glu Glu Arg Arg Ala Leu Val Gly Pro Gly Ser Pro
 368 225 230 235 240
 371 Pro Arg Ser Ala Pro Gly Gln Leu Pro Ser Pro Arg Ala His Ser Leu
 372 245 250 255
 375 Asn Pro Asp Ala Ser Gly Ser Ser Cys Ser Leu Ala Arg Thr Arg Ser
 376 260 265 270
 379 Arg Glu Ser Cys Ala Ser Val Arg Arg Ala Ser Ser Ala Asp Asp Ile
 380 275 280 285
 383 Glu Ala Met Arg Ala Gly Val Leu Pro Pro Pro Pro Arg His Ala Ser
 384 290 295 300
 387 Thr Gly Ala Met His Pro Leu Arg Ser Gly Leu Leu Asn Ser Thr Ser
 388 305 310 315 320
 391 Asp Ser Asp Leu Val Arg Tyr Arg Thr Ile Ser Lys Ile Pro Gln Ile
 392 325 330 335
 395 Thr Leu Asn Phe Val Asp Leu Lys Gly Asp Pro Phe Leu Ala Ser Pro
 396 340 345 350
 399 Thr Ser Asp Arg Glu Ile Ile Ala Pro Lys Ile Lys Glu Arg Thr His
 400 355 360 365
 403 Asn Val Thr Glu Lys Val Thr Gln Val Leu Ser Leu Gly Ala Asp Val

VERIFICATION SUMMARY
PATENT APPLICATION: US/10/000,151

DATE: 12/10/2001
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Input Set : A:\HERG-KCR1.ST25.txt
Output Set: N:\CRF3\12102001\I000151.raw

L:12 M:270 C: Current Application Number differs, Replaced Current Application No
L:12 M:271 C: Current Filing Date differs, Replaced Current Filing Date
L:157 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:1
L:163 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:1
L:165 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:1
L:167 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:1
L:169 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:1